DAFTAR PUSTAKA

Ahmad, W., (2006). Chapter 5: Fundamentals of weathering and soil formation. Dalam: *LATERITES Fundamentals of chemistry, mineralogy, weathering processes and laterite formation.* s.l.:PT VALE INCO, p. 26.

Ahmad, W., (2006). Chapter 6: Formation of laterites and their characteristics. Dalam: *Chapter 6: Formation of laterites and their characteristics. In: LATERITES Fundamentals of chemistry, mineralogy, weathering processes and laterite formation.* s.l.:PT VALE INCO, pp. 1-31.

Arif, I., (2018). *Nikel Indonesia.* 1 ed. Jakarta: PT Gramedia Pustaka Utama.

Askaria, M. G., (2022). *Geologi Dan Hubungan Antara Kendali Geologi Dan Kualitas Nikel Di Pulau Gag, Kepulauan Raja Ampat, Papua Barat,* Yogyakarta: UPN Veteran Yogyakarta.

Brand, N., Elias, C. B. and Mick, E., (1998). NIckel Laterites: Classification and features.. *AGSO Journal of Australian Geology and Geophysic,* Volume 17, pp. 81-88.

Bunaciu, A. A., Udristioiu, E. G. *and* Aboul-Enein, H. Y., (2015). *X-Ray Diffraction: Instrumentation and Applications.* England, Taylor & Francis.

Butt, C. *and* Cluzel, D., (2013). Nickel Laterite Ore Deposits: Weathered Serpentinities. *Element International Magazine of Mineralogy, Geochemistry, and Petrology,* Volume 9, pp. 123-128.

Cohen, A. S., Galaty, M. L. *and* Fisher, C. T., (2018). Petrographic Analysis of Ceramics and Clay from Angamuco, Michoacán.. *Journal of Archaeological Science: Reports,* Volume 19, p. 155–165.

Elias, M., (2002). Nickel laterite deposits – geological overview, resources and exploitation. *CODES Special Publication* .

Foose, M. P., Zientek, M. *and* Klein, D., (1995). *Magmatic Sulfide Deposits.* United States Geology Survey (USGS): Open-File Report.

Freyssinet,P., C.R.M Butt, R.C Morris, *and* P Piantone, (2005). *Ore-Forming Processes Related to Lateritic Weathering,* Economic Geology 100th Anniversary volume, pp 681-722.

Gleeson, S., Butt, C. *and* El, M., (2003). Nickel Laterites : A Review. *Society of Economic Geologists (SEG),* July, pp. 12-18.

', J., (1981). Nickelliferous Laterite Deposits. *Economic Geology 75th* ıiversary Volume, pp. 710-735.

Golightly, J. P. (2010). Progress in Understanding the Evolution of Nickel Laterites. Society of Economic Geologists, 451-000.

Marsh, E., Anderson, E. and Gray, F., (2013). *Nickel-cobalt Laterities-A Deposit Model*. Virginia: U. S. Geological Survey.

Kamaruddin, H., I.K., R. A., Rosana, M. F., Sulaksana, N., & Y, E. T. (2018). Profil Endapan Laterit Nikel Di Pomalaa, Kabupaten Kolaka, Provinsi Sulawesi Tenggara. *Buletin Sumber Daya Geologi*, *13*(2), 84 - 105.

Nahon, D. B., Boulange, B. *and* Colin, F., (1992). Mettalogeny of Weathering: an Introduction, In Martini and Chesworth.. *Weathering, Soil and Paleosols*, pp. 445-471.

Panalytical, B., (2009). *X-Ray Fluorescence Spectrometry*. UK: Boundary Row.

Roqué-Rosell, J., Mosselmans, J. F. W., Proenza, J. A., Labrador, M., Galí, S., Atkinson, K. D., Quinn, P. D., (2010). Sorption of Ni by "Lithiophorite–Asbolane" Intermediates in Moa Bay Lateritic Deposits, Eastern *Cuba. Chemical Geology*, Volume 275, p. 9 – 18.

Rose, A. W., Hawkers, H. E. *and* Webb, J. S., (1979). *Geochemistry in Mineral Exploration.* 2nd ed. London: Academic Press.

Rosika, K., Dian, A. *and* Djoko, K., (2007). *Pengujian Kemampuan XRF untuk Analisis komposisi unsur paduan Zr-Sn-Cr-Fe-Ni.* Bandung, Prosiding Seminar Sains dan Teknologi Nuklir Pusat Teknologi Nuklir bahan dan radiometri (PTNBR) BATAN.

Samama, J., (1986). *Ore Fields and Continetal Weathering.* New York, Van Nostrand Reinhold Co.

Shellmann, W., (1986). A new definition of laterite. *Geologycal Survey of India Memoir 120*, pp. 1-7.

Streckeisen, A.L. (1976). *Classification and Nomenclature of Igneous Rocks*. N. Jahrb. Miner. Abh., 107, 144-240.

Sufriadin dan Mulyono, P., (2013). *Mineralogy, Geochemistry and Leaching Behavior of The Sorowako Nuckeliferous Laterite Deposit, South Sulawesi, Indonesia.* Yogyakarta: Disertasi Fakultas Teknik Geologi, Universitas Gadjah Mada.

Sugiyono, (2012). *Metode Penelitian Kuantitatif R&B.* Bandung: Alfabeta.

, J. J., (1975). *Levolution Geochimique Supergene des Roches abasiques en Zone Tropicale; Formations des Gisements Nickeliferes de velle-Caledonie*. Paris, ORSTOM Mem. 78

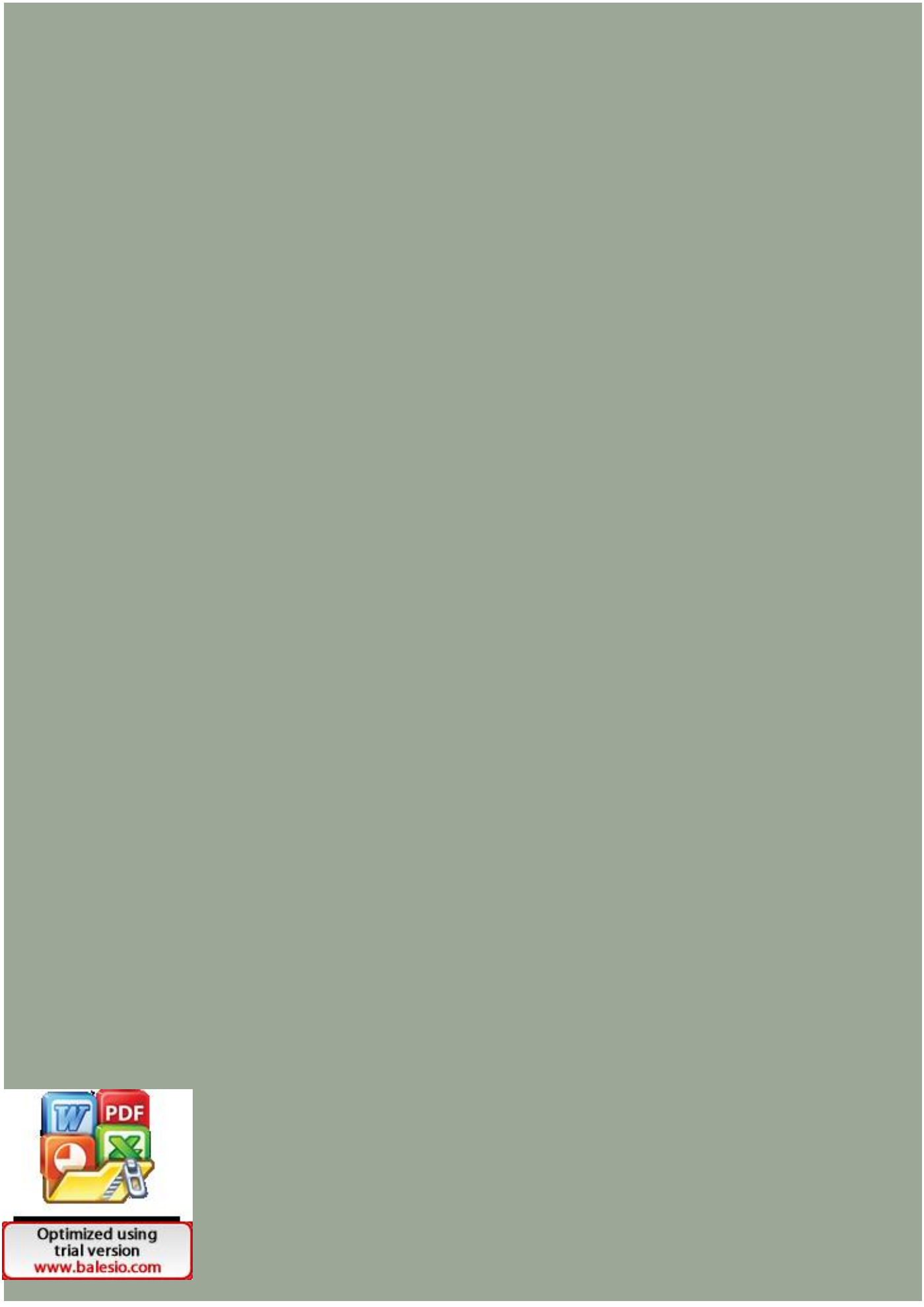
Yildirim, H., A., T. and Yucel, O., (2012). *Nickel Pig Iron (NPI) production from domestic lateritic nickel ores using induction furnace.* Karabuk, Turki, Proceedings international Iron & Steel Symposium.

LAMPIRAN

LAMPIRAN 1

PETA LOKASI PENELITIAN


PDF
Optimized using
trial version
www.balesio.com

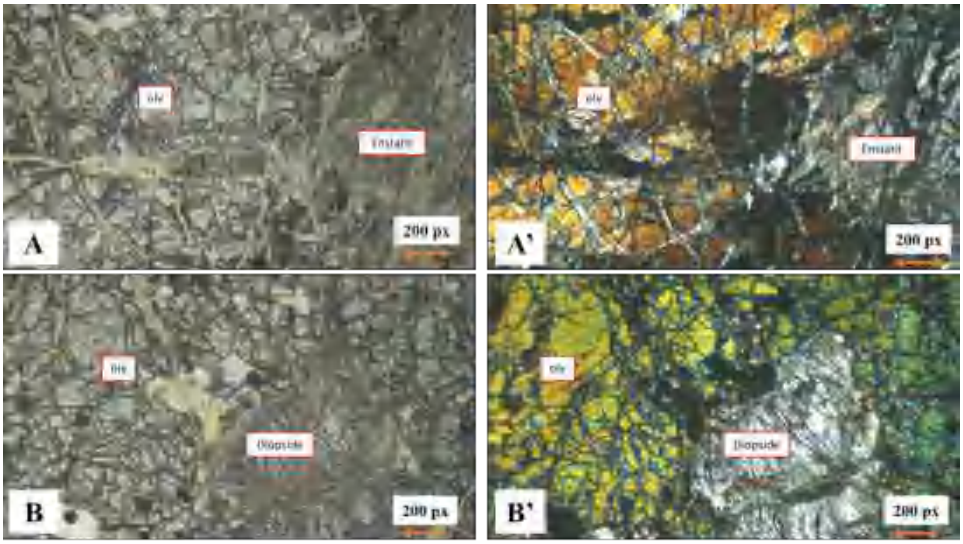


LAMPIRAN 2

PETA LOKASI PENELITIAN

No. Sayatan	: BTG-1	Nama Batuan : Hazburgit
Lokasi	: PTAntam Tbk UBPN Kolaka	

Foto



II-Nikol	X-Nikol

Tipe Batuan	Batuan Beku
Tipe Struktur	Masif
Klasifikasi	Streckeisen, 1976
Mikroskopis	Warna absorsi transparan (*colourless*) pada nikol sejajar dan warna interferensi warna terang pada orde II-III pada nikol silang, memiliki tekstur granularitas faneritik, kristalinitas holokristalin, bentuk euhedral-subhedral, dan relasi equigranular. komposisi mineral terdiri dari olivin, orthopiroksin dan klinopiroksin.

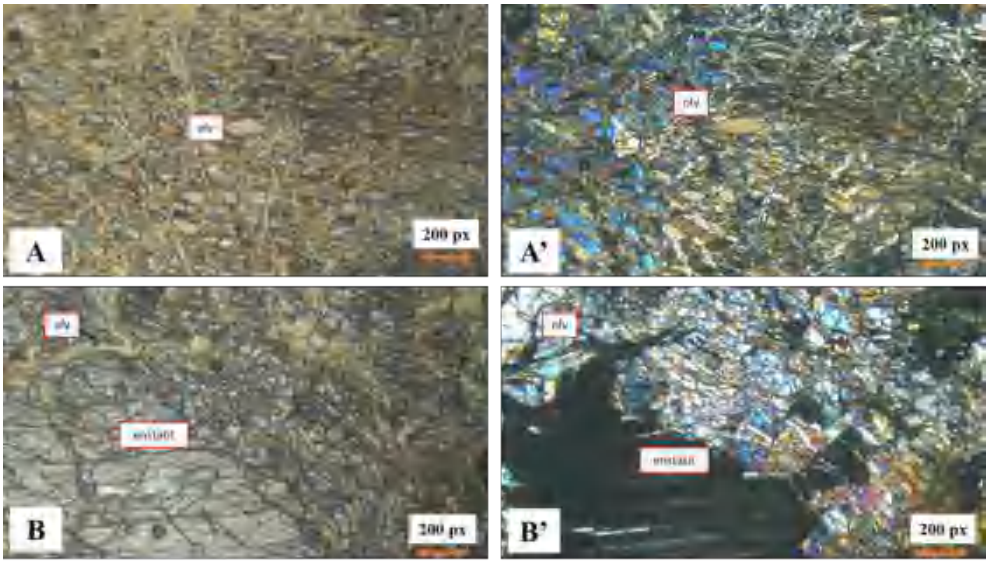
Deskripsi Mineral

Komposisi Mineral	Jumlah (%)	Keterangan Optik Mineral
Olivin	85	Warna absorsi tidak berwarna sedangkan warna interferensi terang pada orde II-III, mineral memiliki relief tinggi, berbentuk subhedral-anhedral, pleokroisme tidak ada, ukuran mineral, belahan paralel tidak sempurna 0,1mm-0,15 mm.
Orthopiroksin (enstatit)	10	Warna absorsi tidak berwarna, semburat agak kehijauan atau keabu-abuan, sedangkan warna interferensi orde I abu-abu atau putih sampai orde tinggi I, menunjukkan belahan prismatik yang berpotongan hampir 90 derajat, berbentuk anhedral dan tidak beraturan, pleokroisme tidak ada atau lemah.
Klinopiroksin (diopsid)	5	Warna absorsi tidak berwarna, sedangkan warna interferensi terang berada pada orde I-II, tidak memiliki pleokroisme, memiliki belahan baik dua arah, terdapat kembaran sederhana.

Nama Batuan: Hazburgit

No. Sayatan	: EVR-1	Nama Batuan : Dunit
Lokasi	: PTAntam Tbk UBPN Kolaka	

Foto



II-Nikol	X-Nikol

Tipe Batuan	Batuan Beku
Tipe Struktur	Masif
Klasifikasi	Streckeisen, 1976
Mikroskopis	Warna absorsi transparan (*colourless*) pada nikol sejajar dan warna interferensi warna terang pada orde II-III pada nikol silang, memiliki tekstur granularitas faneritik, kristalinitas holokristalin, bentuk euhedral-subhedral, dan relasi equigranular. komposisi mineral terdiri dari olivin dan orthopiroksin.

Deskripsi Mineral

Komposisi Mineral	Jumlah (%)	Keterangan Optik Mineral
Olivin	90	Warna absorsi tidak berwarna sedangkan warna interferensi terang pada orde II-III, mineral memiliki relief tinggi, berbentuk subhedral-anhedral, pleokroisme tidak ada, ukuran mineral, belahan paralel tidak sempurna 0,1mm-0,15 mm.
Orthopiroksin (enstatit)	10	Warna absorsi tidak berwarna, semburat agak kehijauan atau keabu-abuan, sedangkan warna interferensi orde I abu-abu atau putih sampai orde tinggi I, menunjukkan belahan prismatik yang berpotongan hampir 90 derajat, berbentuk anhedral dan tidak beraturan, pleokroisme tidak ada atau lemah.

Nama Batuan: Dunit

LAMPIRAN 3

HASIL ANALISIS *X-RAY DIFFRACTION* (XRD)

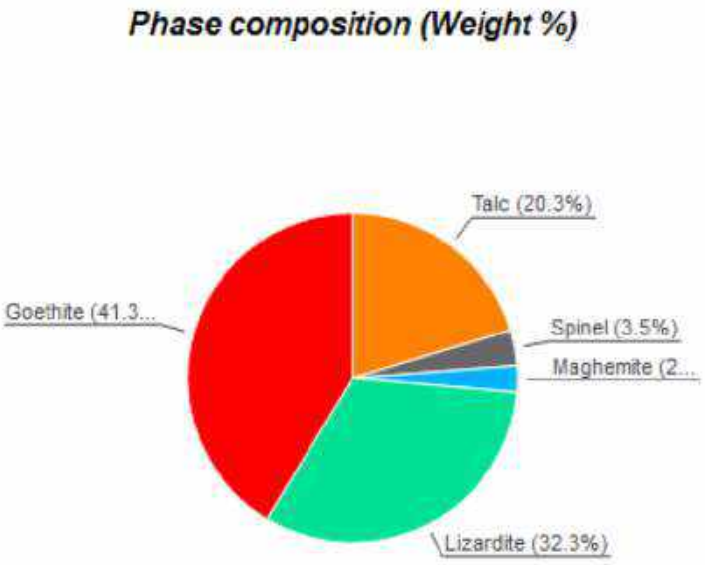
Match! Phase Analysis Report

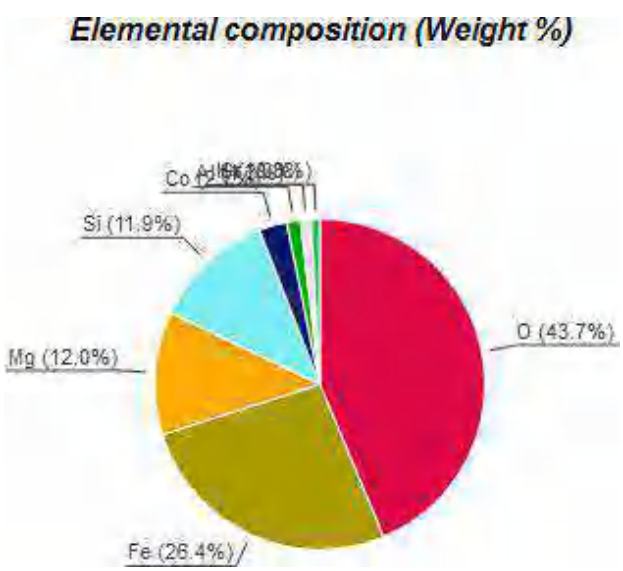
Sample: RL-EVR-03 (5-70)

1 Sample Data

File name	RL-EVR-03.RAW
File path	D:/Sampel Nisa/RL-EVR-03
Data collected	Okt 2, 2023 16:04:46
Data range	5.000º - 70.000º
Original data range	5.000º - 70.000º
Number of points	3251
Step size	0.020
Rietveld refinement converged	NoAlpha2 subtracted No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540600 Å

Analysis Results





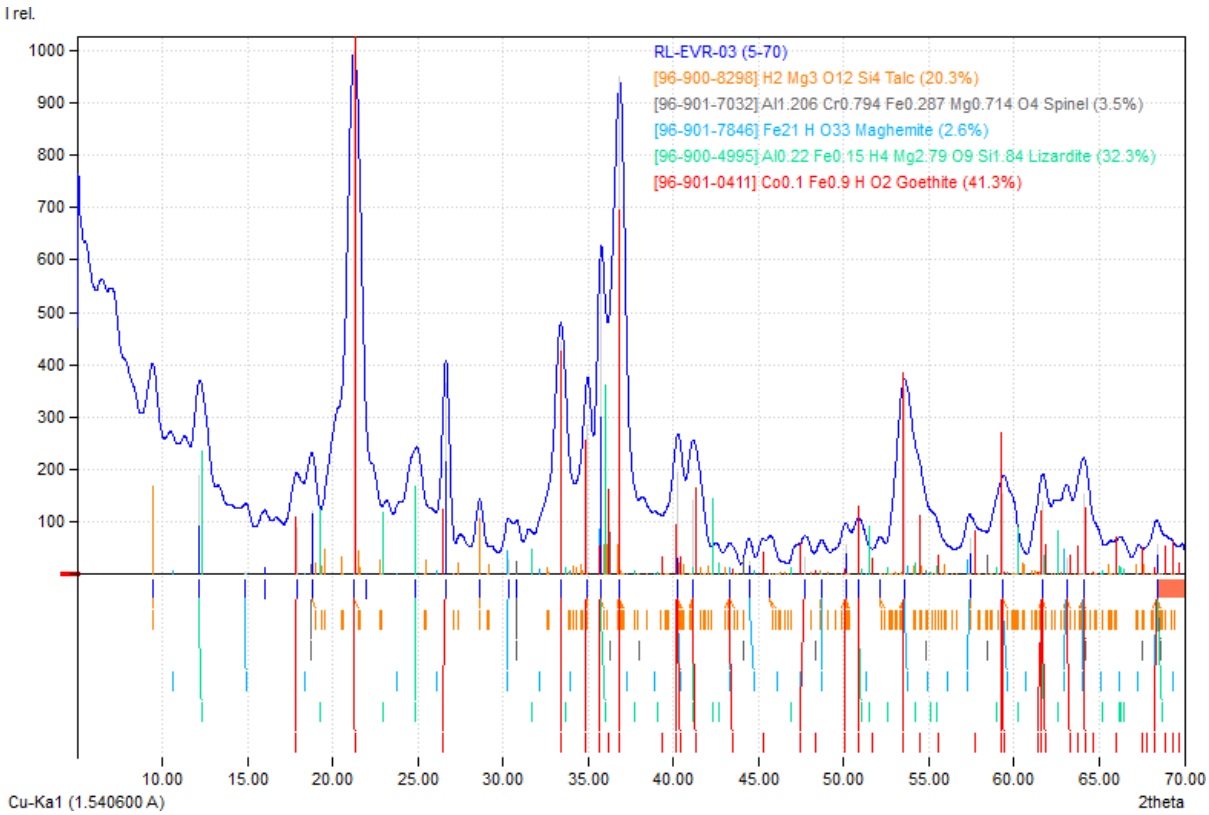
Index	Amount (%)	Name	Formula sum
A	20.3	Talc	H2 Mg3 O12 Si4
B	3.5	Spinel	Al1.206 Cr0.794 Fe0.287 Mg0.714 O4
C	2.6	Maghemite	Fe21 H O33
D	32.3	Lizardite	Al0.22 Fe0.15 H4 Mg2.79 O9 Si1.84
E	41.3	Goethite	Co0.1 Fe0.9 H O2

ak area

A ı eference Intensity Ratio) method

2 Element	Amount (weight %)
O	43.7%(*)
Fe	26.4%
Mg	12.0%
Si	11.9%
Co	2.7%
Al	1.3%
H	1.0%(*)
Cr	0.8%
*LE (sum)	44.8%

Diffraction Pattern Graphics



3 Peak List

No.	2theta [°]	d [Å]	I/I0 (peak height)	Counts (peak area)	FWHM	Matched
1	9.42	9.3810	131.96	8.10	0.5213	A
2	12.20	7.2489	188.20	16.37	0.7386	D
3	14.82	5.9728	3.67	0.35	0.7980	C
4	16.02	5.5280	12.63	1.28	0.8574	
5	17.88	4.9569	89.41	10.28	0.9763	E
6	18.78	4.7213	122.79	8.43	0.5831	A,B
7	21.26	4.1758	1000.00	108.32	0.9199	A,C,E
8	21.94	4.0479	0.33	0.10	2.5814	
9	24.88	3.5759	164.49	18.96	0.9787	D
10	26.66	3.3410	363.29	17.19	0.4019	E
11	28.62	3.1165	61.12	2.89	0.4019	A
12	30.32	2.9455	26.39	1.89	0.6083	C
13	30.82	2.8989	24.34	2.04	0.7115	B
14	33.38	2.6822	443.29	42.53	0.8147	E
15	34.96	2.5645	285.87	50.92	1.5126	A,E
16	35.78	2.5076	605.45	45.63	0.6400	A,C,D,E
17	36.84	2.4378	948.89	76.11	0.6812	A,E
18	40.28	2.2372	195.90	38.03	1.6486	A,C,E
19	41.18	2.1904	140.84	9.54	0.5754	A,D,E
20	43.28	2.0888	14.54	1.27	0.7421	A,C,E
21	44.44	2.0369	25.93	2.77	0.9087	C
22	45.68	1.9845	0.96	0.10	0.8800	A
	47.76	1.9028	34.96	2.03	0.4934	E
	48.68	1.8690	0.92	0.10	0.9200	A,C
	50.12	1.8186	56.07	4.61	0.6982	A,C,E
	50.90	1.7925	0.73	0.10	1.1600	D,E
	52.16	1.7522	0.51	0.10	1.6663	A
	53.58	1.7090	352.04	51.49	1.2420	A,C,E
	57.40	1.6040	69.48	6.10	0.7461	A,C
	59.36	1.5557	152.30	21.57	1.2029	A,C,E
	61.68	1.5026	137.82	16.61	1.0233	A,D,E

32	63.08	1.4726	29.53	2.53	0.7277	A,C,E
33	64.08	1.4520	154.22	32.44	1.7860	A,B,C,E
34	68.42	1.3701	57.51	12.10	1.7860	A,B,C,D,E

Match! Phase Analysis Report

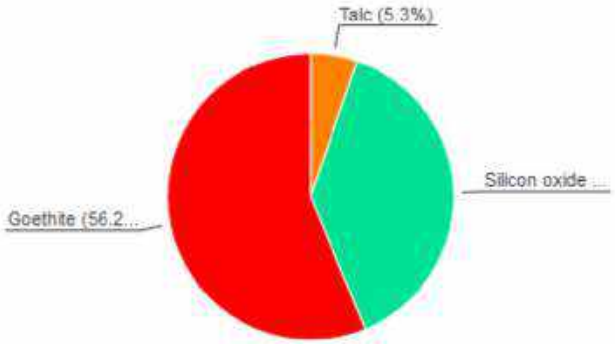
Sample: YL-EVR-03 (5-70)

SAMPLE DATA

File name	YL-EVR-03.ORG
File path	D:/Sampel Nisa/YL-EVR-03
Data collected	Okt 2, 2023 16:04:46
Data range	5.000º - 70.000º
Original data range	5.000º - 70.000º
Number of points	3251
Step size	0.020
Rietveld refinement converged	No Alpha2 subtracted No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540600 Å

Analysis Results

Phase composition (Weight %)



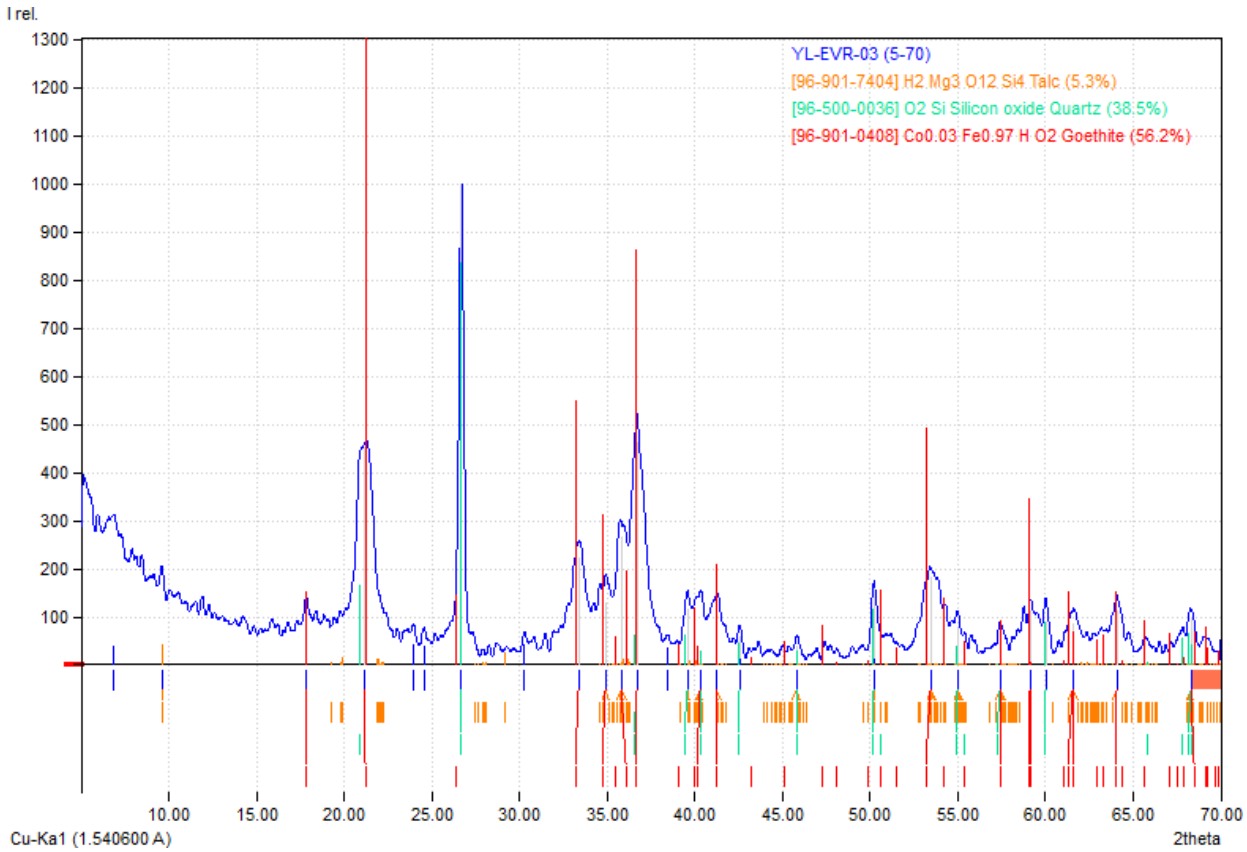
Elemental composition (Weight %)

Index	*Amount (%)*	*Name*	*Formula sum*
A	5.3	Talc	H2 Mg3 O12 Si4
B	38.5	Silicon oxide Quartz	O2 Si
C	56.2	Goethite	Co0.03 Fe0.97 H O2
	11.4	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*43.4%(*)*
Fe	34.2%
Si	19.6%
Co	1.1%
Mg	1.0%
H	*0.7%(*)*
**LE (sum)*	*44.1%*

Diffraction Pattern Graphics



Peak List

No.	*2theta [°]*	*d [Å]*	*I/I0 (peak height)*	*Counts (peak area)*	*FWHM*	*Matched*
1	6.86	12.8750	37.14	3.04	0.3981	
2	9.60	9.2055	40.74	1.32	0.1577	A
3	17.84	4.9679	80.43	8.27	0.5006	C
4	21.18	4.1914	451.50	94.05	1.0139	C
5	23.92	3.7171	40.72	4.31	0.5158	
6	24.58	3.6188	37.63	1.76	0.2280	
7	26.68	3.3385	1000.00	61.61	0.2999	B
8	30.28	2.9493	42.19	2.69	0.3105	
9	33.40	2.6806	220.77	49.76	1.0970	C
10	34.94	2.5659	127.40	15.31	0.5849	A,C
11	35.84	2.5035	264.98	43.55	0.8000	A,C
12	36.70	2.4468	461.92	65.34	0.6886	B,C
13	38.46	2.3388	34.82	3.72	0.5200	
14	39.58	2.2751	115.94	17.52	0.7353	A,B
15	40.34	2.2340	12.06	1.90	0.7686	A,B,C
16	41.28	2.1853	123.47	17.25	0.6800	A,C
17	42.56	2.1225	59.53	3.54	0.2897	B
18	45.80	1.9796	39.79	2.68	0.3280	A,B
19	50.22	1.8152	158.18	12.29	0.3782	A,B
20	53.46	1.7126	180.65	50.08	1.3494	A,C
21	54.98	1.6688	77.07	16.88	1.0663	A,B
	)	1.6040	64.34	5.67	0.4291	A,B,C
	;	1.5605	111.80	24.81	1.0800	C
	?	1.5401	89.99	5.02	0.2713	B
	?	1.5039	86.04	18.16	1.0270	A,C
	;	1.4520	111.40	18.11	0.7912	A,B,C
	)	1.3722	93.89	11.70	0.6068	A,B,C

Match! Phase Analysis Report

Sample: S-EVR-03 (5-70)

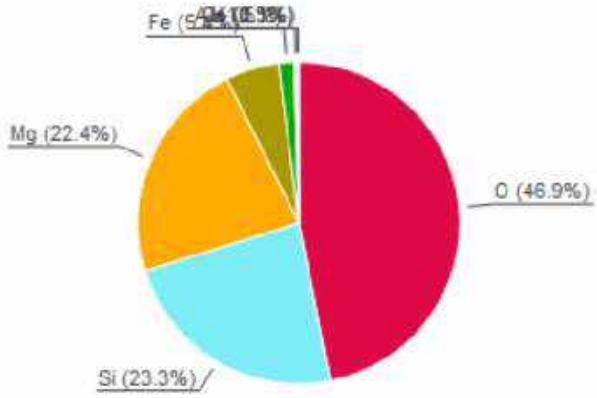
Sample Data

File name	S-EVR-03.ORG	
File path	D:/Sampel Nisa/S-EVR-03	
Data collected	Okt 2, 2023 16:04:46	
Data range	5.000º - 70.000º	
Original data range	5.000º - 70.000º	
Number of points	3251	
Step size	0.020	
Rietveld refinement converged	No	Alpha2 subtracted No
Background subtr.	No	
Data smoothed	Yes	
Radiation	X-rays	
Wavelength	1.540600 Å	

Analysis Results

Phase composition (Weight %)

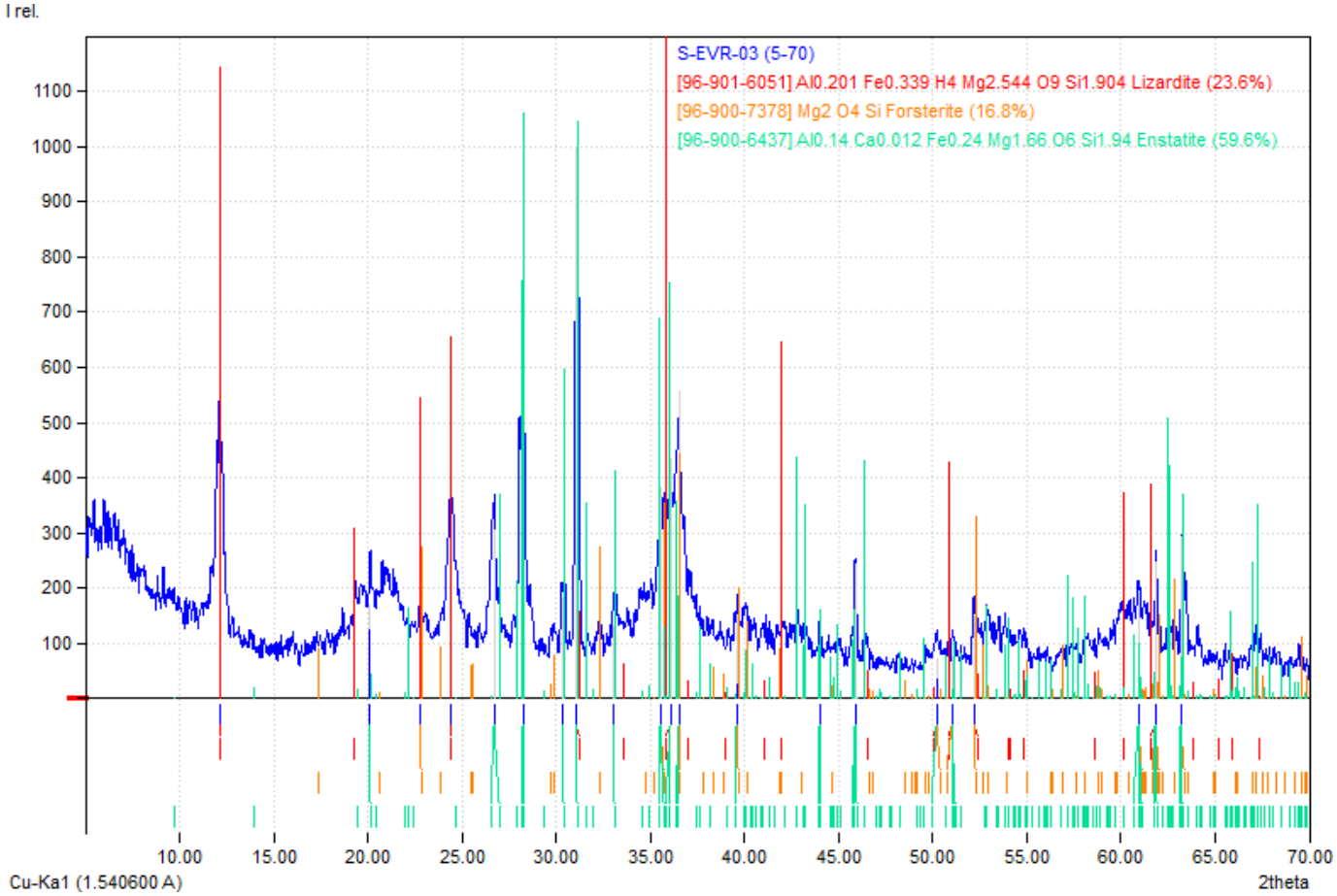
Elemental composition (Weight %)



4	***IndexAmountName***	***Formula sum(%)***
A	23.6 Lizardite	Al0.201 Fe0.339 H4 Mg2.544 O9 Si1.904
B	16.8 Forsterite	Mg2 O4 Si
C	59.6 Enstatite	Al0.14 Ca0.012 Fe0.24 Mg1.66 O6 Si1.94
	18.7 Unidentified peak area	

Ar *eference Intensity Ratio) method*

Diffraction Pattern Graphics



Peak List

No.	*2theta [°]*	*d [Å]*	*I/I0 (peak height)*	*Counts (peak area)*	*FWHM*	*Matched*
1	12.12	7.2966	521.61	58.33	0.4448	A
2	20.12	4.4098	171.27	34.31	0.7968	C
3	22.78	3.9005	108.75	7.48	0.2734	A,B
4	24.38	3.6480	357.12	48.88	0.5445	A
5	26.76	3.3287	305.70	32.41	0.4217	C
6	28.26	3.1554	662.10	54.89	0.3298	C
7	30.38	2.9398	182.86	11.62	0.2529	C
8	31.10	2.8734	1000.00	62.17	0.2473	A,C
9	33.08	2.7058	129.85	13.78	0.4223	C
10	35.56	2.5226	382.01	49.94	0.5200	B,C
11	36.06	2.4887	433.53	156.94	1.4400	A,C
12	36.52	2.4584	557.25	95.26	0.6800	B,C
13	39.64	2.2718	151.36	15.22	0.4000	B,C
14	44.00	2.0563	93.30	4.40	0.1874	C
15	45.88	1.9763	242.75	6.29	0.1031	C
16	50.22	1.8152	71.89	8.29	0.4587	A,B,C
17	51.06	1.7873	74.87	4.81	0.2556	A,B,C
18	52.18	1.7515	149.62	9.43	0.2506	A,B
19	60.92	1.5195	192.12	32.84	0.6800	B,C
20	61.86	1.4987	248.33	8.16	0.1307	A,B,C
21	63.22	1.4697	293.23	10.94	0.1484	B,C

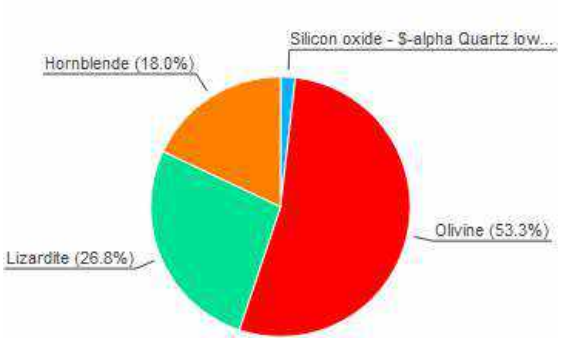
Match! Phase Analysis Report

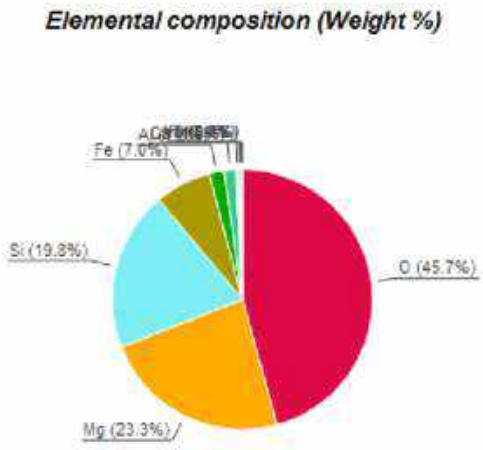
5 Sample: EVR-1 (5-70)

6 Sample Data

File name	EVR-1.RAW	
File path	D:/DATA XRD/EVR-1	
Data collected	Okt 10, 2023 08:16:54	
Data range	5.000° - 70.000°	
Original data range	5.000° - 70.000°	
Number of points	3251	
Step size	0.020	
Rietveld refinement converged	NoAlpha2 subtracted	No
Background subtr.	No	
Data smoothed	Yes	
Radiation	X-rays	
Wavelength	1.540600 Å	

7 Analysis Results



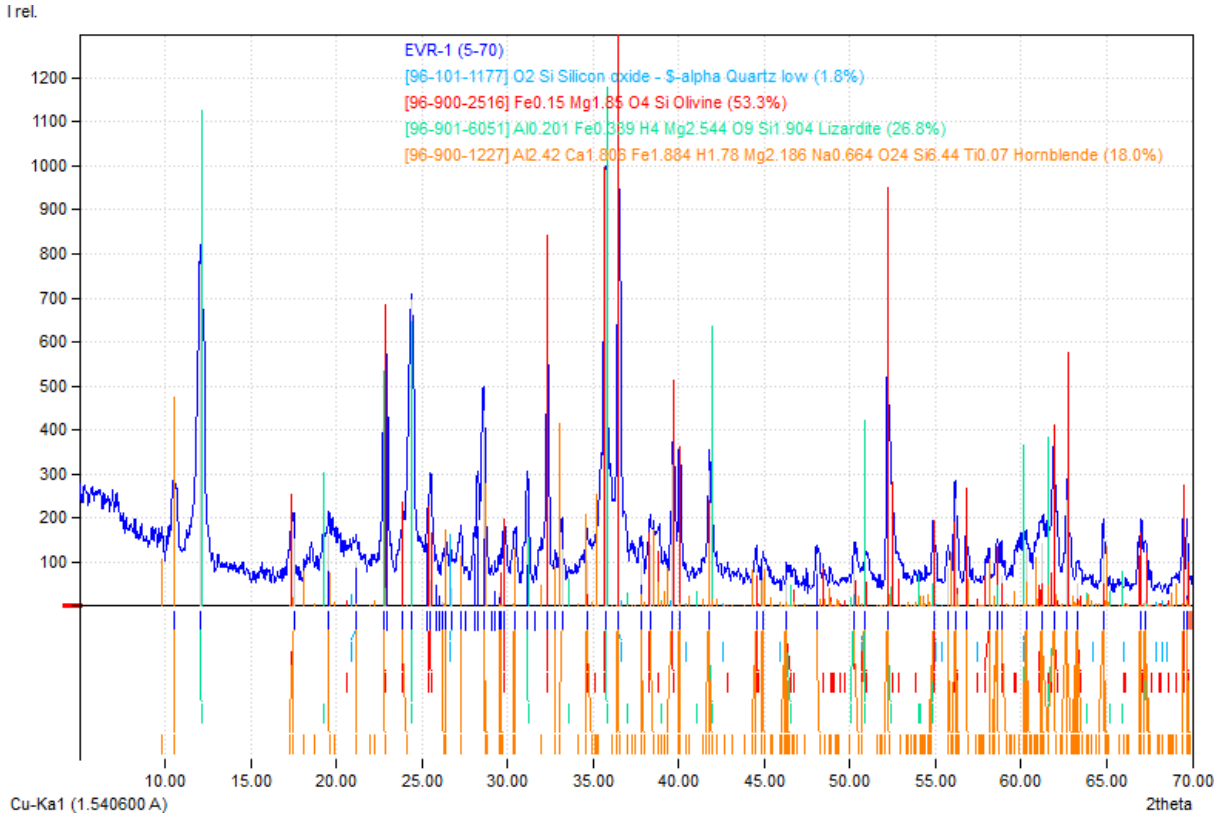


8 Amounts calculated by RIR (Reference Intensity Ratio) method

Index	Amount	Name	Formula sum(%)
A	1.8	Silicon oxide - $-alpha Quartz low	O2 Si
B	53.3	Olivine	Fe0.15 Mg1.85 O4 Si
C	26.8	Lizardite	Al0.201 Fe0.339 H4 Mg2.544 O9 Si1.904
D	18.0	Hornblende	Al2.42 Ca1.806 Fe1.884 H1.78 Mg2.186 Na0.664 O24 Si6.44 Ti0.07
	18.8	*Unidentified peak area*	

Si	19.8%
Fe	7.0%
Al	1.8%
Ca	1.5%
H	0.4%(*)
Na	0.3%
Ti	0.1%
*LE (sum)	46.1%

Diffraction Pattern Graphics



Peak List

No.	2theta [°]	d [Å]	I/I0 (peak height)	Counts (peak area)	FWHM	Matched
1	10.52	8.4025	193.92	26.99	0.4130	D
2	12.08	7.3207	775.96	117.21	0.4481	C
3	17.52	5.0579	152.12	13.78	0.2688	B,D
4	19.58	4.5302	159.06	45.04	0.8400	D
5	21.18	4.1914	101.04	17.71	0.5200	A,D
6	22.78	3.9005	212.25	9.45	0.1321	B,C,D
7	22.96	3.8704	506.55	48.44	0.2837	
8	23.90	3.7202	97.75	13.05	0.3960	B,D
9	24.42	3.6422	695.09	85.25	0.3639	C
10	25.32	3.5147	141.32	45.44	0.9539	
11	25.52	3.4876	56.23	3.26	0.1718	B
12	25.86	3.4425	48.96	1.98	0.1200	
13	26.00	3.4243	22.20	0.83	0.1111	
14	26.22	3.3961	7.92	0.27	0.1022	D
15	26.40	3.3733	89.05	7.62	0.2539	D
16	26.70	3.3361	40.23	3.42	0.2522	A
[illegible]	[illegible]	3.2665	113.17	9.92	0.2599	D
[illegible]	[illegible]	3.2362	0.86	0.10	0.3463	
[illegible]	[illegible]	3.1730	115.69	9.36	0.2400	
[illegible]	[illegible]	3.1532	179.83	27.15	0.4479	
[illegible]	[illegible]	3.1186	443.28	30.39	0.2034	D
[illegible]	[illegible]	3.0703	1.12	0.10	0.2642	
[illegible]	[illegible]	3.0477	33.79	2.59	0.2270	
[illegible]	[illegible]	3.0255	28.80	2.75	0.2837	D

25	29.64	3.0115	0.89	0.10	0.3352	B,D
26	29.82	2.9938	130.24	11.00	0.2507	B
27	30.46	2.9323	121.82	9.49	0.2311	D
28	31.16	2.8680	252.01	17.89	0.2107	C
29	31.62	2.8273	0.46	0.10	0.6508	
30	32.34	2.7660	587.05	34.17	0.1727	B
31	32.78	2.7299	59.76	3.42	0.1697	D
32	33.18	2.6979	129.28	10.06	0.2309	D
33	34.66	2.5860	103.36	17.50	0.5023	B,D
34	35.70	2.5130	988.66	82.89	0.2487	B,C
35	36.50	2.4597	1000.00	80.76	0.2396	A,B,D
36	37.78	2.3793	98.72	11.64	0.3499	B,D
37	38.34	2.3458	136.82	20.08	0.4354	B,D
38	39.66	2.2707	319.70	30.02	0.2786	A,B,D
39	40.04	2.2500	289.38	20.44	0.2095	B,D
40	41.80	2.1593	305.64	25.19	0.2445	B,C,D
41	44.56	2.0317	83.60	7.82	0.2775	B,D
42	44.94	2.0154	64.40	5.52	0.2545	D
43	46.32	1.9586	52.91	2.96	0.1659	B,C,D
44	48.04	1.8924	93.03	8.62	0.2748	D
45	50.28	1.8132	100.59	11.64	0.3432	A,B,C,D
46	50.90	1.7925	73.48	12.55	0.5067	A,B,C,D
47	52.22	1.7503	579.22	39.82	0.2040	B,C,D
48	54.88	1.6716	143.65	11.87	0.2452	A,B,C,D
49	55.72	1.6484	85.50	5.31	0.1842	D
50	56.16	1.6365	243.28	19.50	0.2378	B,D
51	56.78	1.6201	111.10	8.89	0.2373	B,D
52	58.12	1.5859	75.16	5.98	0.2359	B,D
53	58.62	1.5735	101.75	10.94	0.3189	B,C,D
54	58.84	1.5682	69.66	2.74	0.1167	B,D
55	60.28	1.5341	129.71	22.74	0.5200	A,B,C,D
56	61.26	1.5119	141.86	25.56	0.5346	B,D
57	61.90	1.4978	304.43	42.70	0.4161	B,C,D
58	62.70	1.4806	240.73	20.14	0.2482	B,D
59	63.32	1.4676	51.52	5.28	0.3038	B,D
60	64.80	1.4376	151.56	11.01	0.2154	B,D
61	67.02	1.3953	141.93	21.41	0.4474	B,D
62	67.28	1.3905	11.52	0.66	0.1709	B,C,D
63	69.46	1.3521	157.13	8.63	0.1630	B,D
64	69.68	1.3484	157.28	5.48	0.1033	B,D

Match! Phase Analysis Report

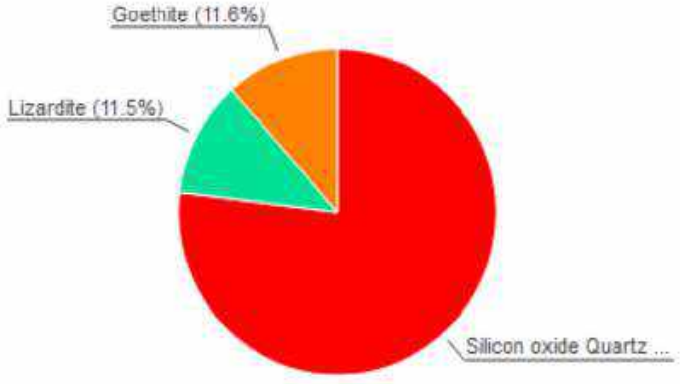
1 SAMPLE: L-BTG-03 (5-70)

2 Sample Data

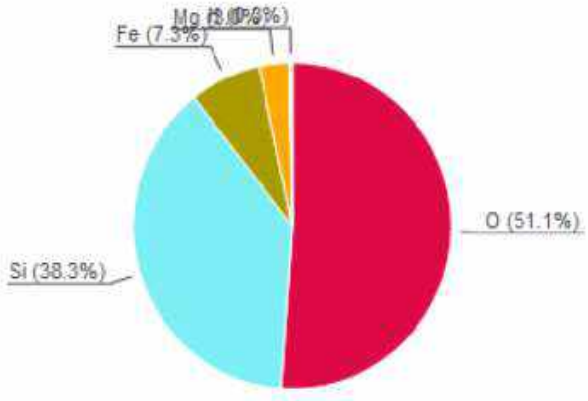
File name	L-BTG-03.ORG
File path	D:/Sampel Nisa/L-BTG-03
Data collected	Okt 2, 2023 16:04:46
Data range	5.000º - 70.000º
Original data range	5.000º - 70.000º
Number of points	3251
Step size	0.020
Rietveld refinement converged	NoAlpha2 subtracted No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540600 Å

3 Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



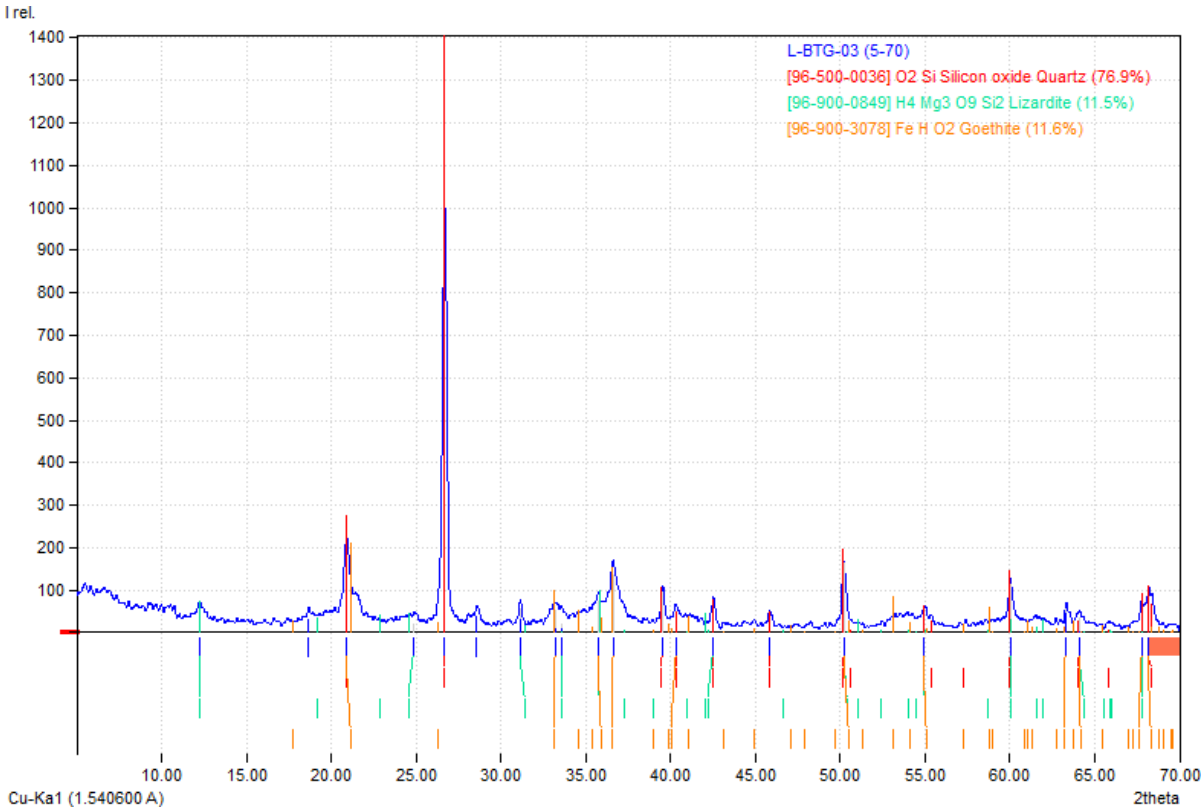
Index	Amount (%)	Name	Formula sum
A	76.9	Silicon oxide Quartz	O2 Si
B	11.5	Lizardite	H4 Mg3 O9 Si2
C	11.6	Goethite	Fe H O2
	15.4	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio)

Element	Amount (weight %)
O	*51.1%(*)*
Si	38.3%
Fe	7.3%
Mg	3.0%
H	0.3%(*)
**LE (sum)*	*51.4*

4

Diffraction Pattern Graphics



5 Peak List

No.	2theta [°]	d [Å]	I/I0 (peak height)	Counts (peak area)	FWHM	Matched
1	12.24	7.2253	35.25	11.18	0.4393	B
2	18.68	4.7464	29.56	7.42	0.3477	
3	20.92	4.2429	203.49	65.34	0.4446	A,C
4	24.86	3.5787	18.85	9.29	0.6823	B
5	26.66	3.3410	1000.00	218.13	0.3020	A
6	28.58	3.1208	36.17	8.51	0.3259	
7	31.16	2.8680	54.40	7.05	0.1795	B
8	33.18	2.6979	50.40	20.66	0.5675	C
9	33.54	2.6697	18.04	6.50	0.4987	B
10	35.72	2.5116	74.49	38.74	0.7200	B,C
11	36.60	2.4532	135.91	57.87	0.5895	A,C
12	39.54	2.2773	94.55	16.58	0.2428	A
13	40.30	2.2361	45.99	13.30	0.4004	A,C
14	42.54	2.1234	69.97	12.62	0.2497	A,B
15	45.82	1.9788	34.42	8.10	0.3260	A
16	50.22	1.8152	163.46	32.41	0.2745	A,B,C
17	54.96	1.6693	46.06	19.85	0.5968	A,B,C
18	60.02	1.5401	112.92	27.12	0.3325	A,B
19	63.32	1.4676	54.68	10.68	0.2705	C
20	64.10	1.4516	35.79	14.20	0.5493	A,B,C
21	67.76	1.3818	5.41	0.53	0.1345	A,B,C
22	68.18	1.3743	85.83	46.03	0.7424	A,C

Match! Phase Analysis Report

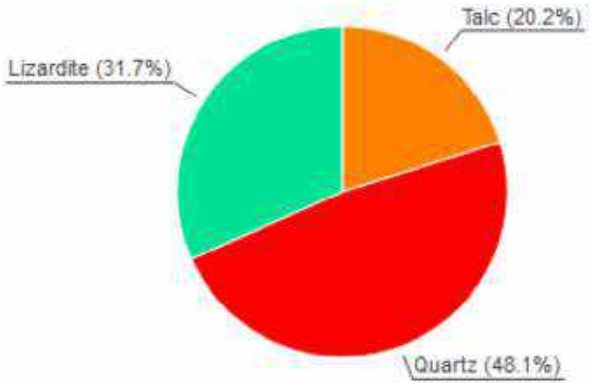
SAMPLE: S-BTG-03 (5-70)

Sample Data

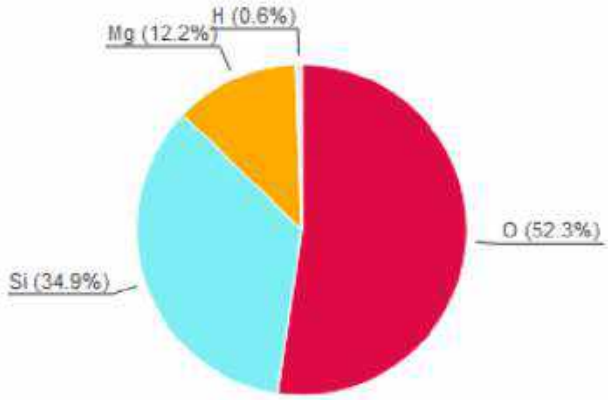
File name	S-BTG-03.ORG
File path	D:/Sampel Nisa/S-BTG-03
Data collected	Okt 2, 2023 16:04:46
Data range	5.000º - 70.000º
Original data range	5.000º - 70.000º
Number of points	3251
Step size	0.020
Rietveld refinement converged	No Alpha2 subtracted No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540600 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)

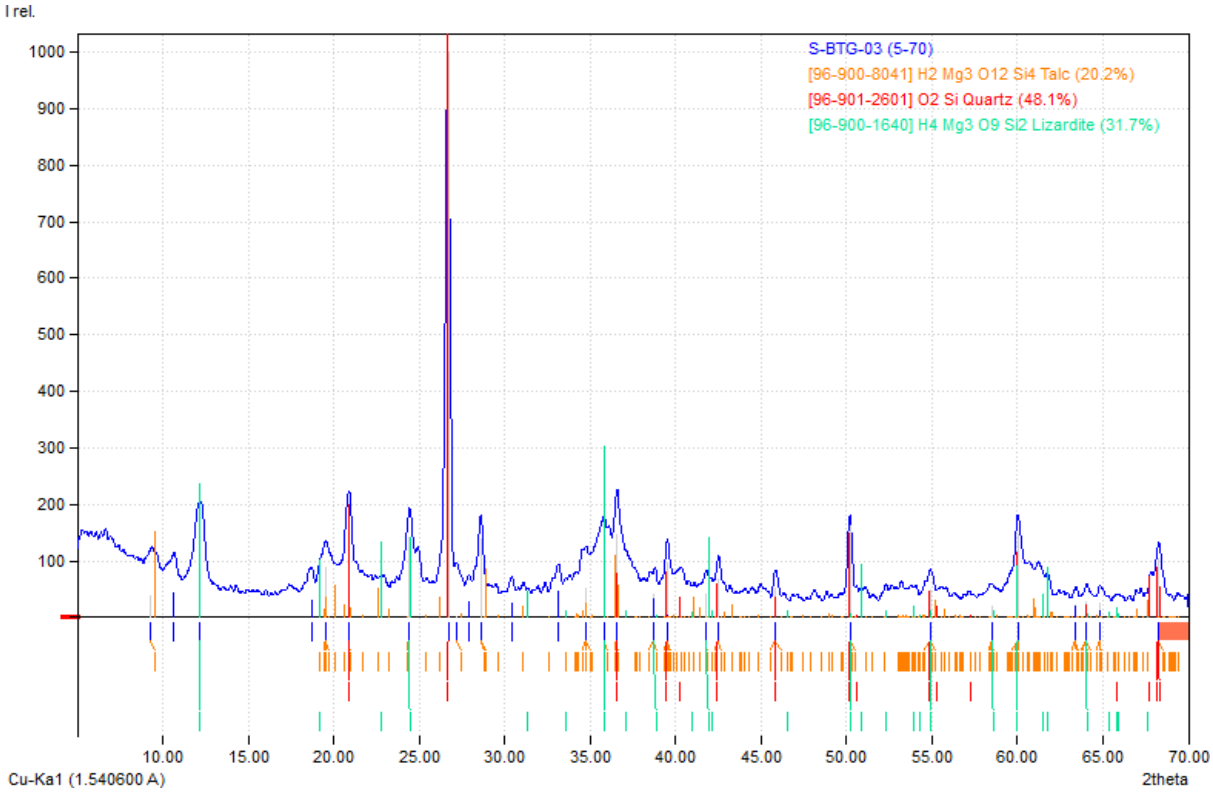


I	*ndex*	*Amount (%)*	*Name*	*Formula sum*
	A	20.2	Talc	H2 Mg3 O12 Si4
	B	48.1	Quartz	O2 Si
	C	31.7	Lizardite	H4 Mg3 O9 Si2
		14.7	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (%) weigl*
O	*52.3%(*)*
Si	34.9%
Mg	12.2%
H	*0.6%(*)*
**LE (sum)*	*52.9%*

Diffraction Pattern Graphics



Peak List

No.	2theta [°]	d [Å]	I/I0 (peak height)	Counts (peak area)	FWHM	Matched
1	9.32	9.4815	39.39	19.60	0.7688	A
2	10.66	8.2924	42.80	11.31	0.4085	
3	12.18	7.2608	163.26	63.52	0.6012	C
4	18.70	4.7413	29.58	4.55	0.2377	
5	19.54	4.5394	87.27	57.40	1.0164	A
6	20.90	4.2469	188.76	61.65	0.5047	A,B
7	24.44	3.6392	142.24	61.58	0.6690	A,C
8	26.72	3.3336	1000.00	196.23	0.3032	B
9	27.18	3.2783	0.14	0.10	1.0973	A
10	27.90	3.1953	27.38	6.38	0.3600	
11	28.60	3.1186	139.61	31.24	0.3458	A
12	30.40	2.9380	26.05	3.90	0.2316	
13	33.12	2.7026	46.58	14.75	0.4894	
14	34.74	2.5802	51.98	21.91	0.6514	A
15	35.80	2.5062	54.82	46.82	1.3200	A,C
16	36.56	2.4558	146.98	147.86	1.5546	A,B
17	38.76	2.3214	40.68	13.00	0.4937	A,C
18	39.52	2.2784	96.96	24.34	0.3879	A,B
19	41.80	2.1593	39.88	12.79	0.4954	A,C
20	42.50	2.1253	68.16	17.09	0.3875	A,B
21	45.86	1.9771	52.60	8.77	0.2576	A,B
22	50.20	1.8159	161.49	29.77	0.2848	A,B,C
23	54.88	1.6716	49.79	19.65	0.6100	A,B,C
24	58.48	1.5770	18.65	17.17	1.4222	A,C
	0.02	1.5401	147.93	53.88	0.5628	A,B,C
	3.42	1.4655	23.22	3.96	0.2638	A
	1.04	1.4528	27.85	5.75	0.3191	A,B,C
	1.82	1.4372	26.05	6.01	0.3563	A
	3.28	1.3726	104.09	35.44	0.5262	A,B

Match! Phase Analysis Report

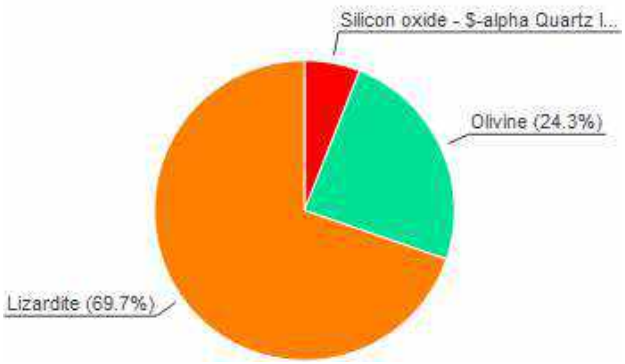
Sample: BTG-1 (5-70)

6 Sample Data

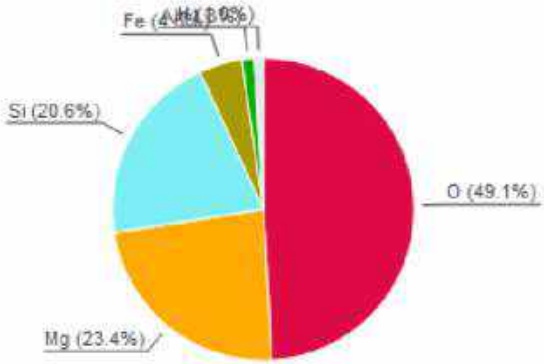
File name	BTG-1.ORG
File path	D:/DATA XRD/BTG-1
Data collected	Okt 10, 2023 08:16:53
Data range	5.000º - 70.000º
Original data range	5.000º - 70.000º
Number of points	3251
Step size	0.020
Rietveld refinement converged	NoAlpha2 subtracted No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540600 Å

7 Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



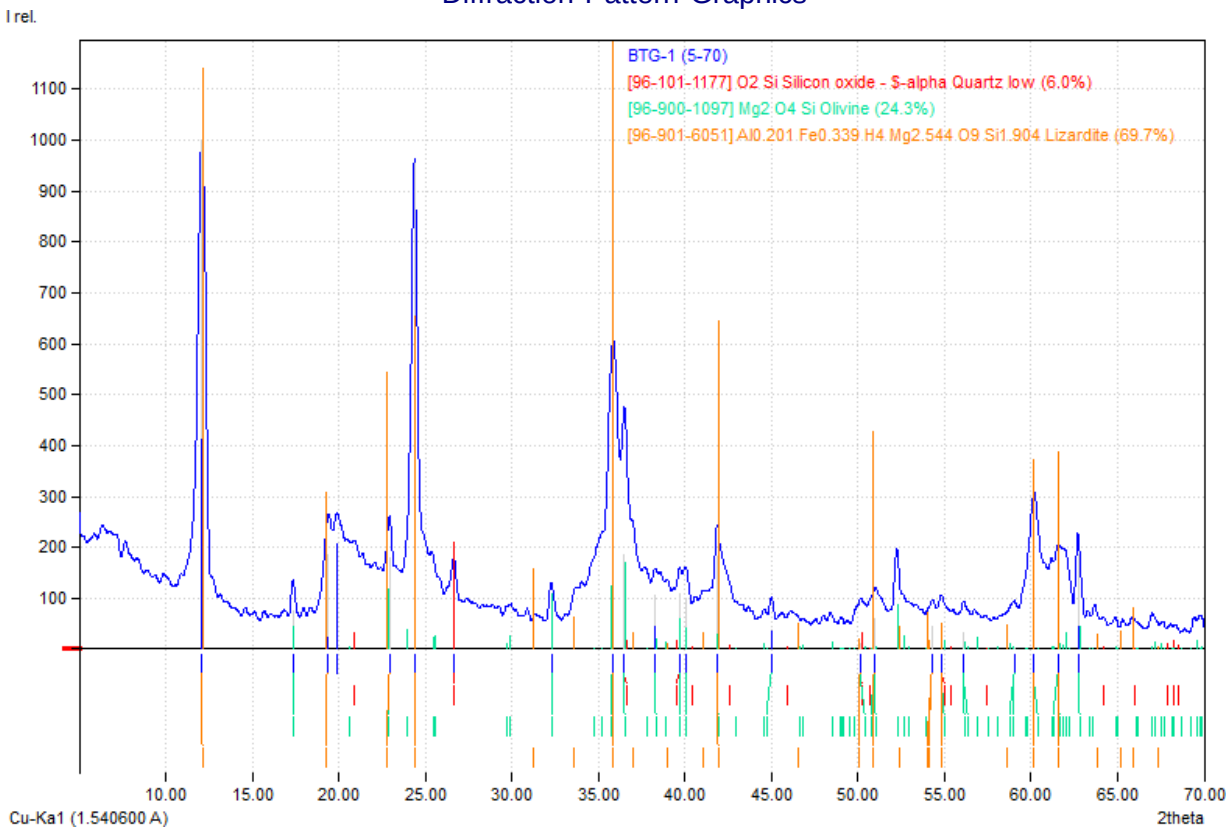
8

	Index	Amount	Name	Formula sum(%)
	A	6.0	Silicon oxide - $-alpha Quartz low	O2 Si
B	24.3	Olivine		Mg2 O4 Si
C	69.7	Lizardite		Al0.201 Fe0.339 H4 Mg2.544 O9 Si1.904
	12.5	*Unidentified peak area*		

Si	20.6%
Fe	4.6%
Al	1.3%
H	*1.0%(*)*
*LE (sum)	50.1%

Amounts calculated by RIR (Reference Intensity Ratio) method

Diffraction Pattern Graphics



Peak List

No.	2theta [°]	d [Å]	I/I0 (peak height)	Counts (peak area)	FWHM	Matched
1	12.10	7.3086	1000.00	173.84	0.4694	C
2	17.36	5.1042	75.40	5.50	0.1968	B
3	19.40	4.5718	184.17	79.82	1.1704	C
4	19.92	4.4536	206.68	122.46	1.6000	
5	22.96	3.8704	180.57	51.24	0.7663	B,C
6	24.38	3.6480	954.41	148.23	0.4194	C
7	26.64	3.3435	114.05	23.87	0.5652	A
8	32.28	2.7710	82.29	8.67	0.2844	B
9	35.86	2.5022	524.16	228.96	1.1796	B,C
10	36.50	2.4597	186.42	26.89	0.3895	A,B
11	38.28	2.3494	105.78	17.24	0.4400	B
12	39.70	2.2685	108.21	48.08	1.2000	A,B
13	40.04	2.2500	100.80	40.01	1.0720	B
14	41.86	2.1563	182.32	41.50	0.6146	B,C
15	45.00	2.0129	37.59	6.97	0.5006	B
16	50.16	1.8172	9.98	1.63	0.4400	A,B,C
17	51.00	1.7893	61.08	30.71	1.3577	B,C
18	54.26	1.6892	43.06	20.01	1.2547	C
19	54.82	1.6733	45.82	19.54	1.1516	A,B,C
20	56.08	1.6386	32.17	4.59	0.3853	B
21	59.02	1.5638	2.51	1.73	1.8589	B
22	60.16	1.5369	257.73	86.04	0.9015	A,B,C
23	61.58	1.5048	158.33	64.48	1.0998	B,C
24	62.72	1.4802	186.64	23.39	0.3384	B